A PROCESS FOR APPLYING ADDITIVES TO CROPS DURING HARVEST USING COMPRESSED AIR TO DISTRIBUTE THE ADDITIVE EVENLY ON THE CROP

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SUMMARY OF THE INVENTION: The process that has been invented employs a stream of air under pressure to deliver low rates of additives to crops, so that the air distributes the additive to the crop evenly. The additive being applied at ratios under 2% of the crop being treated is thus evenly distributed leading to more effective response to the additive.

BACKGROUND OF THE INVENTION

Additives are in common use for purposes of aiding in the preservation of the crop during storage. Two types of additives are the most common: 1. Acid to reduce bacterial activity: and, 2. Inoculants to add favorable activity. These additives must be applied at time of harvest to provide the maximum benefit in the aid to preservation of the crop. Harvesting of the crop takes place over a large area through the use of mobile harvesting equipment such as forage harvesting and baling implements. These implements have been designed for maximum speed in harvesting with very little consideration of being compatible with the requirements of applying the additives used to aid in the preservation of the crop. The carrying capacity of harvesting equipment for additives being used is limited to small amounts of material. It is beneficial to use additives that require the lowest ratio of additive to crop so with limited carrying capacity, the harvesting implement is not stopping to refill small reservoirs for the additives on a frequent basis.

Additives to aid in the preservation of crops have been developed with increasing lower ratios of application in recent years. High-strength acid formulas have been introduced that are effective in controlling bacterial growth when applied at ratios a low as .005% of the crop being treated. Highly concentrated inoculants have been developed that are effective at rates as low as .001% of the crop being treated. These low inclusion rate products have reduced the need to stop and fill the reservoirs on the harvesting implements.

The problem that arises with the products that have low rates of application is attaining

even coverage over the complete crop being treated. To be effective on the entire crop, coverage of these additives must be even on the entire crop. For liquids, conventional spray techniques are less than effective at these low rates.

SPECIFICATIONS:

The process that has been invented combines a high volume of air delivered to the crop and a low volume metering of the additive into the stream of air to carry and distribute the additive into the crop. In a typical embodiment of the process, a means of pumping air **1** is mounted on the harvesting equipment such as forage harvesting or baling implements. The airflow from the source, **1**, pump, compressor or supply of compressed air, is normally between .1 and 5 cubic feet per minute. It is delivered into a line **2** and routed to a spray orifice **3**. The orifice will deliver the air in an even fan-type pattern **4** when the air before the tip is delivered under pressure, typically between 5 and 100 pounds per square inch. When this spray orifice **3** is oriented in a position on the harvesting implement where the crop is flowing evenly in front of the tip, the air covers the crop evenly.

In the typical embodiment, a reservoir **5** to hold the additive is also located on the harvesting equipment. A metering device **6** is used to dispense the additive into the line **2**. The metering device **6** regulated the proper application of the additive base on flow of the product. The metering device **6** may also have a means of preventing air from flowing into the reservoir **5** and also must have the capability to deliver product into the line **2**, overcoming the line pressure developed by the air supply **1**. In a typical embodiment the metering device **6** used is a positive displacement pump, which will prevent air from entering the reservoir **5** and will deliver product at a pressure high enough to overcome the air pressure in the line **2**. This pump can be equipped with a means to regulate flow so that the amount of additive discharged to the crop is matched to the rate of harvest and the desired ratio of application can be maintained. Distance from